In the claims:

For the Examiner's convenience, all pending claims are presented below with

changes shown in accordance with the mandatory amendment format.

1.   (Previously Presented) A computer-implemented method comprising:

receiving an instruction executed by a Virtual Machine Monitor (VMM);

identifying, based on the instruction, that an initial transition from the VMM to one or

more virtual machines (VMs) is about to occur; and

utilizing processor-managed resources associated with the one or more VMs based on

the initial transition.

2.   (Previously Presented) The method of claim 1 wherein the initial transition from the

VMM to the one or more VMs is a first-time invocation of a VM.

3.-4.   (Canceled)

5.   (Previously Presented) The method of claim 1 wherein the instruction executed by the

VMM is a VM launch instruction.

6.   (Previously Presented) The method of claim 1 wherein identifying the initial

transition comprises determining the initial transition is about to occur by logic within a

processor.

7.   (Original) The method of claim 6 wherein the logic within the processor is prediction

logic.

8.   (Original) The method of claim 1 wherein utilization of processor-managed resources

includes at least one of allocation of one or more processor-managed resources, de-allocation

of one or more processor-managed resources, verification of data stored in one or more processor-managed resources, invalidation of data stored in one or more processor-managed resources, and loading of data into one or more processor-managed resources.

9.   (Previously Presented) A computer-implemented method comprising:
        determining that an initial transition from a virtual machine monitor (VMM) to a virtual machine (VM) is about to occur based on invocation information of the VM; and
        notifying a processor of the initial transition by the VMM executing an instruction associated with the initial transition.

10.   (Canceled)

11.   (Previously Presented) The method of claim 9 wherein the initial transition is an initial transfer to the VM.

12.   (Previously Presented) The method of claim 11 further comprising allocating a memory region for a new virtual machine control structure (VMCS) associated with the VM, and requesting the processor to activate the new VMCS.

13.   (Original) The method of claim 12 wherein requesting the processor to activate the new VMCS comprises executing a VMCS pointer load instruction including a pointer to the new VMCS as an operand.

14.   (Original) The method of claim 12 further comprising requesting the processor to initialize the new VMCS.

15.   (Original) The method of claim 14 wherein requesting the processor to initialize the new VMCS comprises executing a VMCS clear instruction including the pointer to the new VMCS as an operand.

16.   (Original) The method of claim 12 further comprising:

upon requesting the processor to activate the new VMCS, requesting the processor to set execution control information, VMM state information and VM state information in the new VMCS.

17.   (Original) The method of claim 16 wherein requesting the processor to set execution control information, VMM state information and VM state information in the new VMCS comprises executing a VMCS write instruction having an operand that identifies a component of the new VMCS to which data is to be written.

18.   (Canceled)

19.   (Previously Presented) A computer-implemented method comprising:
        identifying execution by a virtual machine monitor (VMM) of an instruction associated with an initial transition from the VMM to a virtual machine (VM), the initial transition being based on invocation information of the VM;
        receiving, from the VMM, a request to perform the initial transition; and
        performing a set of operations according to the initial transition.

20.-21. (Canceled)

22.   (Previously Presented) The method of claim 19 wherein further comprising:
        prior to receiving the request to perform the initial transition, receiving from the VMM a pointer to a virtual machine control structure (VMCS) associated with the VM.

23.   (Original) The method of claim 22 wherein the pointer to the VMCS is included as an operand of a VMCS pointer load instruction.

24.   (Previously Presented) The method of claim 22 wherein performing the set of operations comprises marking the VMCS as cleared when receiving a request from the VMM to initialize the VMCS, determining that the VMCS is in a cleared state, performing a plurality of validation checks on at least one of VMM state information and VM state

information, storing the VMM state information to the VMCS, loading the VM state information into a processor storage, marking the VMCS as launched, and beginning to execute the VM.

25.   (Original) The method of claim 24 wherein the request to initialize the VMCS is a VMCS clear instruction executed by the VMM, the VMCS clear instruction including the pointer to the VMCS as an operand.

26.   (Original) The method of claim 22 wherein performing the set of operations further comprises allocating an on-processor cache storage for the VMCS upon determining that the VMCS is in a cleared state, and caching information stored in the VMCS to the on-processor cache storage during operation of the VM.

27.-29. (Canceled)

30.   (Currently Amended) An apparatus comprising a hardware platform with a processor and a memory that operate in tandem to implement:
        a processor notification module in the virtual machine monitor (VMM) to notify a processor of an initial transition from the VMM to one or more virtual machines (VMs);
        a resource use determinator to identify, based on the notification, the initial transition from the VMM to the one or more VMs is about to occur; and
        a resource optimizer to utilize processor-managed resources including processor registers, processor cache, memory, and input/output (I/O) devices associated with the one or more VMs based on the initial transition.

31.   (Previously Presented) The apparatus of claim 30 wherein the initial transition is a first-time invocation of a VM.

32.   (Canceled)

33.   (Previously Presented) The apparatus of claim 30 further comprising a VMM behavior predictor in a processor to predict the initial transition.

34.   (Original) The apparatus of claim 30 wherein the resource optimizer is to utilize the processor-managed resources by performing at least one of allocation of one or more processor-managed resources, de-allocation of one or more processor-managed resources, verification of data stored in one or more processor-managed resources, invalidation of data stored in one or more processor-managed resources, and loading of data into one or more processor-managed resources.

35.   (Currently Amended) An apparatus comprising <u>a hardware platform with a processor and a memory that operate in tandem to implement</u>:
      a transition type determinator to determine that an initial transition from a virtual machine monitor (VMM) to a virtual machine (VM) is about to occur based on invocation information of the VM; and
      a VMM operation controller to notify a processor of the initial transition by the VMM executing an instruction associated with the initial transition.

36.   (Canceled)

37.   (Previously Presented) The apparatus of claim 35 wherein the VMM operation controller is to respond to the initial transfer to the VM by allocating a memory region for a new virtual machine control structure (VMCS) associated with the VM, requesting the processor to initialize the new VMCS, requesting the processor to activate the new VMCS, and requesting the processor to set execution control information, VMM state information and VM state information in the new VMCS.

38.   (Original) The apparatus of claim 37 wherein the VMM operation controller is to request the processor to activate the new VMCS by executing a VMCS pointer load instruction including a pointer to the new VMCS as an operand.

39.   (Original) The apparatus of claim 37 wherein the VMM operation controller is to request the processor to initialize the new VMCS by executing a VMCS clear instruction including the pointer to the new VMCS as an operand.

40.   (Canceled)

41.   (Currently Amended) An apparatus comprising a hardware platform with a processor and a memory that operate in tandem to implement:

      a notification receiver to:

           identify execution by a virtual machine monitor (VMM) of an instruction associated with an initial transition from the VMM to a virtual machine (VM), the initial transition being based on invocation information of the VM;

           receive, from the VMM, a request to perform the initial transition; and

      an operation performer to perform a set of operations according to the initial transition.

42.   (Canceled)

43.   (Original) The apparatus of claim 41 wherein the notification receiver is further to receive from the VMM a pointer to a virtual machine control structure (VMCS) associated with the VM.

44.   (Original) The apparatus of claim 41 wherein the pointer to the VMCS is included as an operand of a VMCS pointer load instruction executed by the VMM.

45.   (Previously Presented) The apparatus of claim 41 wherein the operation performer is to respond to a VMM request for an initial transition to the VM by determining that the VMCS is in a cleared state, performing a plurality of validation checks on at least one of VMM state information and VM state information, storing the VMM state information to the VMCS, loading the VM state information into a processor storage, marking the VMCS as

launched, and beginning to execute the VM.

46.   (Original) The apparatus of claim 45 wherein the operation performer is
further to allocate an on-processor cache storage for the VMCS upon determining that the
VMCS is in the cleared state and to cache information stored in the VMCS to the on-
processor cache storage during operation of the VM.

47.-49. (Canceled)

50.   (Previously Presented) A system comprising:

a memory; and

a processor coupled to the memory; and

processor-managed resources coupled to the processor that are associated with one or
more virtual machines (VMs), wherein the processor is to:

receive an instruction executed by a Virtual Machine Monitor (VMM);

identify, based on the instruction, that an initial transition from the VMM to
the one or more VMs is about to occur; and

utilize the processor-managed resources based on the initial transition.

51.   (Previously Presented) The system of claim 50 wherein the initial transition from the
VMM is a first-time invocation of a VM.

52.   (Canceled)

53.   (Previously Presented) A system comprising:

a memory to store guest software; and

a processor, coupled to the memory to:

identify execution by a virtual machine monitor (VMM) of an instruction

associated with an initial transition from the VMM to the guest software, the initial

transition being based on invocation information of the guest software;

      receive, from the VMM, a request to perform the initial transition and perform a set of operations according to the initial transition.

54.-55. (Canceled)

56.   (Previously Presented) A machine-readable medium containing instructions which, when executed by a processing system, cause the processing system to perform a method, the method comprising:

      determining that an initial transition from a virtual machine monitor (VMM) to a virtual machine (VM) is about to occur based on invocation information of the VM; and

      notifying a processor of the initial transition by the VMM executing an instruction associated with the initial transition.

57.-58. (Canceled)